

Dividing Whole Numbers and Fractions

What is half of 20?

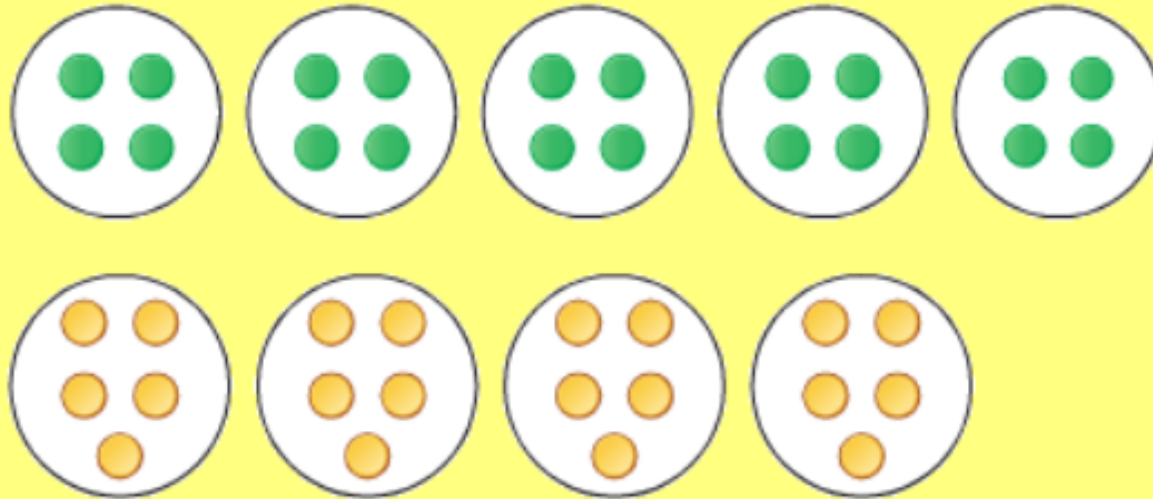
How have we learned to write this mathematically?

20 x 1/2 or 1/2 x 20

What is another way to say this?

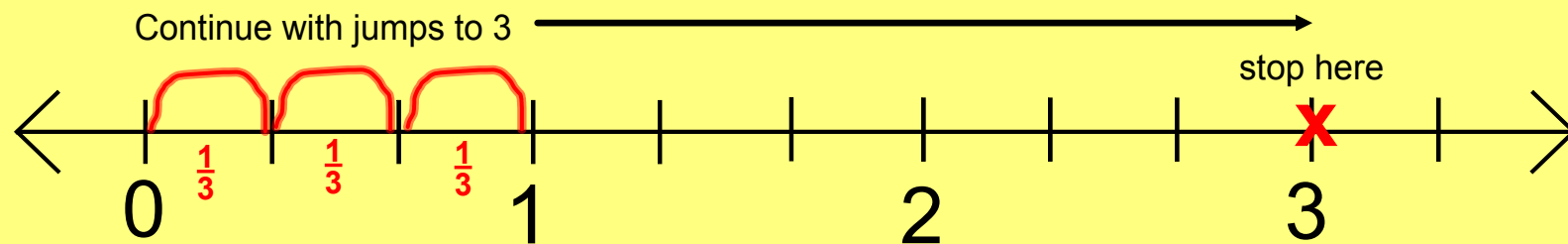
$$20 \div 2$$

$$20 \div 5$$



$$20 \div 4$$

$$3 \div \frac{1}{3}$$



**This question is asking,
How many $\frac{1}{3}$'s are there in 3?
We can just count by $\frac{1}{3}$'s until we get to 3.
Then just count how many jumps we made.**

The Rule

Dividing by a fraction is the same as multiplying by its reciprocal.

Number

$$\frac{1}{2}$$

$$2\frac{2}{3}$$

$$2\frac{2}{3} = \frac{8}{3}$$

Reciprocals

$$2 = \frac{2}{1}$$

$$2\frac{3}{2} = 1\frac{1}{2}$$

$$\frac{3}{8}$$

Divide by a number

$$8 \div 2$$

is the same as:

$$8 \times \frac{1}{2}$$

Multiply by its reciprocal

Mixed Numbers have to be changed to an improper fraction first and then multiply by the reciprocal.

$$\frac{1}{2} \div 2\frac{2}{3}$$

Use the reciprocal of the divisor only! Leave the first fraction (dividend) the same.

$$\frac{1}{2} \div \frac{8}{3} = \frac{1}{2} \times \frac{3}{8}$$

Multiply by the reciprocal

4. Write the reciprocal of each fraction.

a) $\frac{5}{9}$

b) $\frac{3}{7}$

c) $\frac{7}{8}$

d) $\frac{14}{15}$

Example

4 a)

$$\frac{5}{9} \rightarrow \frac{9}{5} = 1\frac{4}{5}$$

Reciprocal

Change improper fraction to
mixed number

Find each quotient.

a) $\frac{7}{10} \div \frac{3}{10}$

b) $\frac{5}{9} \div \frac{2}{9}$

c) $\frac{3}{5} \div \frac{2}{5}$

d) $\frac{4}{5} \div \frac{2}{5}$

Example a)

Always start by writing out the question

$$\frac{7}{10} \div \frac{3}{10} \quad \frac{7}{\cancel{10}} \times \frac{\cancel{10}^1}{3} = \frac{7}{3} = 2\frac{1}{3}$$

Rewrite the question showing that you are multiplying by the reciprocal. *You can now FORGET about the first part* and just multiply the two fractions like you usually would.